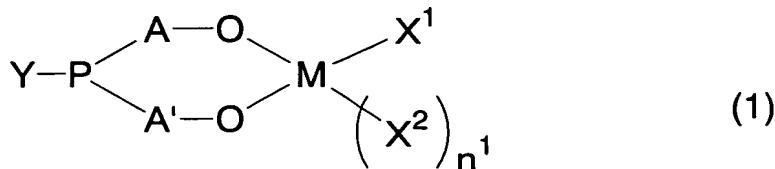


CLAIMS

1. A transition metal complex of formula (1):



wherein M represents an element of Group 6 of Periodic Table of Elements,

A and A' are the same or different and represent a substituted or unsubstituted C1-10 alkylene group, 10 a substituted or unsubstituted C6-18 phenylene group, a substituted or unsubstituted C10-20 naphthylene group,

or

a silylene group substituted with substituted or unsubstituted C1-20 hydrocarbon,

15 Y represents a substituted or unsubstituted C1-10 alkyl group,

a substituted or unsubstituted C7-20 aralkyl group,

a substituted or unsubstituted C6-20 aryl group,

20 a silyl group substituted with substituted or unsubstituted C1-20 hydrocarbon,

X¹ and X² are the same or different and represent a hydrogen atom, a halogen atom,

a substituted or unsubstituted C1-10 alkyl group,

a substituted or unsubstituted C7-20 aralkyl group,

25 a substituted or unsubstituted C6-20 aryl group,

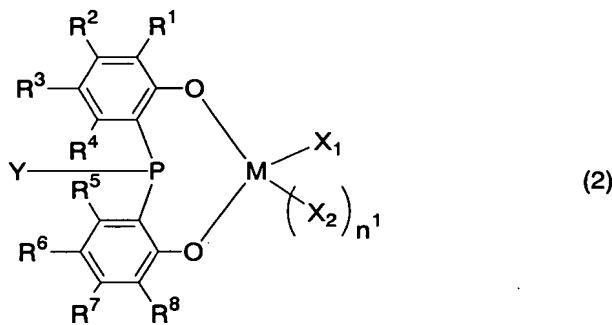
a substituted or unsubstituted C1-10 alkoxy group,

a substituted or unsubstituted C7-20 aralkyloxy group,
a substituted or unsubstituted C6-20 aryloxy group, or
an amino group disubstituted with C1-20 hydrocarbon, and
n¹ is an integer of 0 to 3.

5

2. The transition metal complex according to claim 1,
wherein at least one of A and A' is a substituted or unsubstituted
C6-20 phenylene group.

10 3. The transition metal complex according to claim 1,
wherein the compound of formula (1) is a compound of formula
(2):



15 wherein M represents an element of Group 6 of Periodic Table
of Elements,

Y represents a substituted or unsubstituted C1-10 alkyl
group,

a substituted or unsubstituted C7-20 aralkyl group,

a substituted or unsubstituted C6-20 aryl group,

20 a silyl group substituted with substituted or
unsubstituted C1-20 hydrocarbon,

R¹, R², R³, R⁴, R⁵, R⁶, R⁷ and R⁸ are the same or different
and represent a hydrogen atom, a halogen atom, an C1-10 alkyl
group, an C1-10 alkoxy group, or

a silyl group substituted with C1-20 hydrocarbon,
X¹ and X² are the same or different, and represent a hydrogen
atom, a halogen atom,
a substituted or unsubstituted C1-10 alkyl group,
5 a substituted or unsubstituted C7-20 aralkyl group,
a substituted or unsubstituted C6-20 aryl group,
a substituted or unsubstituted C1-10 alkoxy group,
a substituted or unsubstituted C7-20 aralkyloxy group,
a substituted or unsubstituted C6-20 aryloxy group, or
10 an amino group disubstituted C1-20 hydrocarbon, and
n¹ is an integer of 0 to 3.

4. The transition metal complex according to any one of
claims 1 to 3, wherein Y is a substituted or unsubstituted C1-10
15 alkyl group, or a substituted or unsubstituted C6-20 aryl group.

5. The transition metal complex according to any one of
claims 1 to 4, wherein M is a chromium atom.

20 6. An olefin polymerization catalyst obtained by combining
the transition metal complex as defined in any one of claims
1 to 5 with the following compound (A),

Compound (A): any one of the following compounds (A₁) to
(A₃), or a mixture of two or more of them

25 (A₁): an organic aluminum compound of formula
(E₁)_aAl(Z')_(3-a),

(A₂): cyclic aluminoxane having a structure of formula
{ -Al(E₂) -O- }_b,

(A₃): linear aluminoxane having a structure of formula

$(E_3)\{-Al(E_3)-O-\}_cAl(E_3)_2$

wherein E_1 to E_3 are the same or different, and represent a C1-8 hydrocarbon group, Z 's are the same or different, and represent a hydrogen atom or a halogen atom, a represents 1, 2 or 3, b is 5 an integer of 2 or more, and c represents an integer of 1 or more.

7. The olefin polymerization catalyst according to claim 6, which is obtained by further combining the following compound 10 (B),

Compound (B): any one of the following compounds (B_1) to (B_3), or a mixture of two or more of them

(B_1): a boron compound of formula $BQ_1Q_2Q_3$,

(B_2): a boron compound of formula $Z^+(BQ_1Q_2Q_3Q_4)^-$,

15 (B_3): a boron compound of formula $(L-H)^+(BQ_1Q_2Q_3Q_4)^-$,

wherein B is a trivalent boron atom, Q_1 to Q_4 are the same or different and represent a halogen atom, a C1-20 hydrocarbon group, a halogenated C1-20 hydrocarbon group, a silyl group substituted with C1-20 hydrocarbon, an C1-20 alkoxy group, or an amino group 20 disubstituted with C1-20 hydrocarbon, Z^+ represents an inorganic or organic cation, and L represents a neutral Lewis base.

8. The olefin polymerization catalyst according to claim 6 or 7, wherein the transition metal complex is a reaction product 25 obtained by reacting a compound of formula (3):



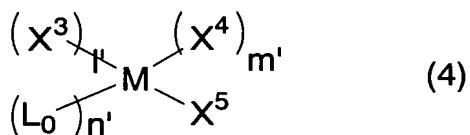
wherein A and A' are the same or different, and represent

a substituted or unsubstituted C1-10 alkylene group,
a substituted or unsubstituted C6-18 phenylene group,
a substituted or unsubstituted C10-20 naphthylene group,

or

5 a silylene group substituted with substituted or
unsubstituted C1-20 hydrocarbon,
Y represents a substituted or unsubstituted C1-20 alkyl
group,

10 a substituted or unsubstituted C7-20 aralkyl group,
a substituted or unsubstituted C6-20 aryl group,
a substituted or unsubstituted silyl group substituted
with C1-20 hydrocarbon, with
a transition metal compound of formula (4):



15 wherein M represents an element of Group 6 of Periodic Table
of Elements,

X³, X⁴ and X⁵ are the same or different, and represent a
hydrogen atom, a halogen atom,

20 a substituted or unsubstituted C1-10 alkyl group,
a substituted or unsubstituted C7-20 aralkyl group,
a substituted or unsubstituted C6-20 aryl group,
a substituted or unsubstituted C1-10 alkoxy group,
a substituted or unsubstituted C7-20 aralkyloxy group,
a substituted or unsubstituted C6-20 aryloxy group, or
25 an amino group disubstituted with C1-20 hydrocarbon,

L₀ represents a neutral ligand selected from ether, sulfide,
amine, phosphine, or olefin, and l', m', and n' represent

independently an integer of 0 to 2.

9. The olefin polymerization catalyst according to claim 8, wherein the molar ratio of the compound of formula (3) and 5 the transition metal compound of formula (4) is 1:0.1 to 1:10.

10. A process for preparing an olefin polymer, which comprises polymerizing olefin utilizing an olefin polymerization catalyst as defined in any one of claims 6 to 10 9.

11. A process for preparing a transition metal complex of formula (1) as defined in claim 1, which comprises reacting a compound of formula (3):



15 wherein A and A' are the same or different, and represent a substituted or unsubstituted C1-10 alkylene group, a substituted or unsubstituted C6-18 phenylene group, a substituted or unsubstituted C10-20 naphthylene group,

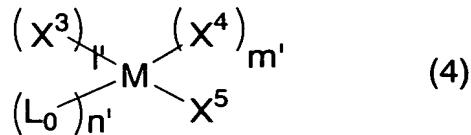
20 or

a silylene group substituted with substituted or unsubstituted C1-20 hydrocarbon,

Y represents a substituted or unsubstituted C1-10 alkyl group,

25 a substituted or unsubstituted C7-20 aralkyl group, a substituted or unsubstituted C6-20 aryl group, a silyl group substituted with substituted or

unsubstituted C1-20 hydrocarbon, with
a transition metal compound of formula (4):



wherein M represents an element of Group 6 of Periodic Table
5 of Elements,

X^3 , X^4 and X^5 are the same or different, and represent a
hydrogen atom, a halogen atom,

a substituted or unsubstituted C1-10 alkyl group,

a substituted or unsubstituted C7-20 aralkyl group,

10 a substituted or unsubstituted C6-20 aryl group,

a substituted or unsubstituted C1-10 alkoxy group,

a substituted or unsubstituted C7-20 aralkyloxy group,

a substituted or unsubstituted C6-20 aryloxy group, or
an amino group disubstituted with C1-20 hydrocarbon,

15 L_0 represents a neutral ligand selected from ether, sulfide,
amine, phosphine or olefin, and l' , m' and n' represent
independently an integer of 0 to 2.